THE PRINCIPLES AND PRACTICES OF CITRUS CULTURE

THE SAN DIMAS CITRUS NURSERIES
SAN DIMAS, LOS ANGELES COUNTY, CALIFORNIA, U. S. A.

THE EVER BEAUTIFUL KUMQUAT.

See Page 25.

LEADER OF THE WORLD

THE leading commercial orange of the world is the Washington Navel, which finds its greatest perfection under a California sun. Its supremacy covers superb eating qualities, possessing a delightful citrous, aromatic and sweet flavor, abundant juice and fine grain free from "rag"; seedless; good shape, with a highly colored peel of protective quality, smooth and closely knit, rendering it one of the best shipping oranges known to commerce. In California it represents fully seventy per cent of the total output of oranges, constituting the large commercial significance of our citrus industry. Our trees are the result of careful selection of buds taken from orchards producing only perfect fruit and yielding annually prolific, profitable crops of yellow, golden globes. This fruit is pictured in all its California glory on the reverse side of this sheet.

PRINCIPLES AND PRACTICES OF CITRUS CULTURE IN CALIFORNIA. A TREATISE DESCRIBING METHODS FROM THE NURSERY TREE TO THE FULL BEARING ORCHARD, INCLUDING THE HARVESTING AND PACKING, THAT HAVE MADE THE CITRUS INDUSTRY OF CALIFORNIA THE ADMIRATION OF POMOLOGISTS EVERYWHERE

BASED ON TWENTY-FIVE YEARS EXPERIENCE WITH THE ORANGE AND LEMON

"These trees shall be my books
And in their barks my thoughts I'll character"
As You Like It. iii, 3.

FIFTH EDITION. PUBLISHED YEARLY BY THE SAN DIMAS CITRUS NURSERIES. FOUNDED IN 1889 BY R. M. TEAGUE; INCORPORATED IN 1913. PAID UP CAPITAL STOCK $250,000.00
R. M. TEAGUE, PRESIDENT AND MANAGER
R. W. TEAGUE, SECRETARY-TREASURER
SAN DIMAS, CALIFORNIA, U. S. A.
PRICE 25 CENTS

A composite spray of Citrus Fruits.

Marsh Pomelo	Eureka Lemon
Kumquat	Ruby Blood
Dancy Tangerine	Valencia Late

QUALITY CITRUS TREES

AT NO time in the history of commercial citrus culture has the outlook been more auspicious, nor the extent of the industry in California greater, than at the present time. In spite of the fact that the annual output of oranges and lemons has been a constantly increasing factor, there has also been a corresponding exploitation of new markets, which has maintained remunerative prices and sustained values in orchard properties. This has also sustained a healthy demand for good nursery trees. Indeed, at no time in the history of the San Dimas Citrus Nurseries has there been a keener interest nor a higher appreciation on the part of intending citrus planters for *Teague Quality Trees.* During the past few years our sales have been annually increasing, and at the same time cover a wide geographical area, extending all over this State, Old Mexico, South American States, Cuba, Porto Rico, the Hawaiian Islands, the Philippines, Australia, South Africa, China, Japan and India. This demonstrates that ours is not only the greatest fruit-producing section in the world, but that California-grown nursery stock and California-grown seeds and bulbs are commanding recognition wherever horticulture has a commercial existence.

The contents of this book will be found reliable and to the point. We have been especially careful and conservative in our descriptions of varieties, aiming to be plain and concise. The numerous half-tones, showing orchards planted to our trees and those picturing methods of planting, cultivating, irrigating, harvesting and packing, are direct from photographs, hence authentic. Of themselves, they form a splendid object lesson in the growth and care of a citrus orchard, and also show that our trees are properly grown in the nurseries to produce best results when submitted to the test of orchard growth.

In the way of land and improvements our facilities for growing only quality trees are more extensive than ever, enabling us to not only supply the best orange, lemon and grapefruit trees in the world, but also to grow them in larger numbers than any other similar establishment. Our history for the past twenty-five years verifies this statement. The record of the past is the promise of the future—which will not only be maintained, but augmented and improved as time goes on. To plant *Teague* trees is to insure a good orchard, other things being equal.

SAN DIMAS CITRUS NURSERIES.

View of full bearing Washington Navel Teague tree.

THE IMPORTANCE OF AN INDUSTRY

CLASSICAL literature first mentions the orange as early as 450 B. C. This, of course, was somewhat early for the embryo Californians of that date. In Hebrew it was called "Hadar," meaning "the beautiful." In Roman literature it was known as Adam's apple, or Paradise apple. We find no reference to any orange known as the Roman navel, but in more modern times they have learned something about the Washington navel, because the San Dimas Citrus Nurseries have been purely experimental, along ornamental lines rather than for commercial purposes; the varieties were limited exclusively to seedlings, which were more or less a feature of all the early Mission gardens planted by the Spanish pioneers. For nearly 100 years its development was almost stationary, scarcely enough fruit being produced for limited home consumption. Nor did the first influx of the Americans in the fifties and sixties stimulate citrus planting to any appreciable extent. A stray orchard here and

Marsh Seedless Pomelo orchard, six years old, planted to Teague trees, producing from five to seven field boxes per tree.

sending good trees to the land of the Caesars. All of which goes to show that California horticulture is winning its spurs in all portions of the world.

To go a little farther along this same line, the books will tell you that the citrus fruits are native to India and China, but say very little as to varieties, methods of culture and marketing. It is said that the tree was introduced from its habitat to the warmer regions of the Mediterranean along about the twelfth century, and that it found its greatest exploitation in Spain and Italy. From the former it was undoubtedly introduced into America. Some 350 years ago one Bernal Dian el Castillo is said to have planted a few orange trees in old Mexico, from whence it eventually found its way to California and Florida. Its early planting, however, was there in and about Los Angeles and the more thickly settled portions of the San Gabriel valley, a few trees at San Diego, with a scattering in the San Joaquin and Sacramento valleys, constituted the visible orange planting of the country. It was not until the seventies that the orange and the lemon excited sufficient interest to merit consideration as a business proposition. The results attained at about that time in Riverside, around Pasadena, in Orange county and other points were so alluring as to attract people and capital from all sections to its importance. Indeed, it developed so rapidly and gave such splendid returns to the growers that we now surpass in production any other section of the world favorable to its growth. Citrus history in our own times merits a paragraph to itself.

In 1883 there were shipped out of Southern California 150 carloads; in 1886 the volume of production had increased to 1,000 carloads; in 1890-91 Los Angeles County (at that time including Orange County) had to its credit 2,212 cars, and San Bernardino County (then including what is now Riverside County) shipped out 1,708 cars; in 1898-99 the total shipment in Southern California aggregated 15,000 carloads, valued at about $12,000,000. In 1906-07 the output was about 25,000 carloads, valued at $19,000,000. It is interesting in this connection to note the annual shipments covering the periods from 1891-92 down to the present time from Southern California:

	Lemons Cars	Oranges Cars	Total Cars
1891- 2			4,016
1892- 3			4,400
1893- 4			5,871
1894- 5			5,022
1895- 6			7,575
1896- 7			7,350
1897- 9	1,166	13,987	15,153
1898- 9	903	9,448	10,351
1899-00	1,447	16,362	17,809
1900-01	2,924	21,173	24,097
1901-02	2,816	17,571	20,387
1902-03	2,649	19,776	22,425
1903-04	2,782	25,117	27,899
1904-05	4,274	25,608	29,882
1905-06	3,789	22,175	25,964
1906-07	3,507	23,986	27,493
1907-08	4,959	24,538	29,497
1908-09	6,196	31,895	39,091
1909-10	4,777	25,316	30,093
1910-11	6,764	36,821	43,585
1911-12	5,961	30,327	36,288
1912-13	2,192	13,574	15,706
1913-14	2,696	38,923	41,619

Shipments from points north of the Tehachapi were as follows:

	Total Cars
1902-03	1,304
1903-04	1,567
1904-05	1,734
1905-06	1,564
1906-07	2,333
1907-08	3,150
1908-09	2,501
1909-10	2,555
1910-11	2,814
1911-12	4,392
1912-13	2,565
1913-14	6,305

The increase of acreage from year to year during this period is problematical. The area planted was, of course, necessarily large—much larger than the volume of fruit actually shipped would indicate, because numbers of orchards were planted in situations unsuitable, either by reason of soil or climate; others were planted and neglected and allowed to lapse; while still others went to ruin through improper methods of cultivation and management. In a broad sense, however, the output at present represents something like sixty-eight or sixty-nine thousand acres in bearing trees, valued, approximately at $200,000,000, the annual output of which, taking the State as a whole, must be in the neighborhood of something like $20,000,000. It would be interesting to note the acreage of recent planting about to come into bearing; which is, however, a phase of the subject hard to solve along intelligent lines. There has been a strong and healthy planting going on for the past few years in the thermal belt of the San Joaquin valley. It is estimated that there are

Original Washington Navel tree in Riverside.

in that belt at the present writing about five thousand acres in bearing, and fully seven to eight thousand acres in various stages of development under full bearing age.

Having said something of the total output and its bearing on the industry, it may not be amiss to refer somewhat briefly to the cost of production. The cost of bringing an orchard into bearing is, indeed, an elastic question, depending almost entirely upon local conditions of soil, climate, water, the lay of the land, whether the owner and his family are to do the work or it is to be accomplished by hired labor, besides many minor points which render accurate

estimates almost impossible. Basing figures on our experience in our home neighborhood, we should say that the cost of preparing and grading the land and planting the trees will average from $15 to $25 to the acre, which includes cultivation for the first season. After that, the cost will be according to the amount of labor expended, from $15 to $25 per acre, up to the fourth year, at which time it should produce about one box of fruit to the tree, and increase from that time on, according to the amount of labor and care expended on the orchard. The amount of irrigating water is usually about one inch to ten acres for the first two seasons, one and one-half inches for the following two, two inches for the fifth and sixth, and after that, an inch for every four acres. The expense of caring for the orchard will average all the way from $25 to $60 per acre, everything depending on the cost of water and labor, and whether the owner's family handles the enterprise or he uses hired help.

Eureka lemon orchard planted to Teague trees, producing $8.50 per tree gross for seven years.

It is an aphorism in California that if a person is about to engage in horticulture, the first essential requirement will be water. Having secured it, it will then be time enough to look for land to put it on. To no industry does this apply so forcibly as to the growing of the orange and the lemon. Hence, if you are about to plant a grove, be sure, (1) that you have an abundant water supply; (2) that your soil is adapted to the business; (3) that your climatic conditions are right; (4) that you will master the details of the business and become proficient in the growing of only first-class fruit. These are the ground principles; the secondary items to observe are the planting of good trees and only commercial varieties—those that have stood the test of the market place and have invariably brought returns. A poor tree (one stunted, or badly grown, or with a bad root system) is expensive to plant, even as a gift. Its original cost is the smallest item to be considered, for, bear in mind that to have an un-

profitable tree in your orchard after expending four years of time in its cultivation and bringing it into a bearing condition is indeed an expensive luxury. So we say if you have the water, the soil, the climatic conditions, and will then plant good trees of standard commercial varieties of oranges and lemons to a very few, namely, in oranges, the Washington Navel, the Valencia Late, and in a lesser degree the Mediterranean Sweet, Paper Rind St. Michael and the Tangerine. In lemons we have the Eureka, the Villa

A superb San Dimas Washington Navel orange grove with a record and planted to Teague trees.

varieties, and give them intensive culture, you may safely go into the citrus business in any of the sheltered portions of California and make money.

The law of the survival of the fittest applies to all things in the vegetable and animal world, and to nothing more forcibly than in the atmosphere of the market place, where only the good survive and the poor perish. Elimination has simmered down the Franca and the Lisbon, here listed in the order of their commercial importance. In the pomelo, or grapefruit, Marsh's Seedless is the only variety planted commercially. Obviously, there are other varieties which possess merit and are capable of bringing returns, but in the main the foregoing now constitute the California varieties that command markets in the United States.

FROM NURSERY TREE TO BEARING ORCHARD

THE several operations essential to the production of quality orange and lemon trees are matters that do not appeal vitally to the intending planter of a profitable citrus fruit orchard. He is, however, directly concerned in the creation and establishment of profitable production in his horticultural enterprise. Good citrus nursery stock entails experience and care: thrifty seedlings properly budded at the right time, and so trained and developed as to insure beyond a reasonable doubt trees that when planted in orchard form will be prolific of profitable fruit that will grade as fancy and choice. An experience of twenty-five years in the growing of citrus trees has enabled us to grow and produce superior stock in this respect—a condition largely demonstrated in the fact that a very great percentage of the best commercial orchards in this State are planted to *Teague* trees.

Possibly a word as to why Teague citrus trees stand supreme may not be out of place at this time. To give emphasis to our claims, some reference is required as to methods and care employed in the operations involved. In the first place we exercise the greatest care in the selection of strong, vigorous and plump seed; there are two methods of sowing the seed, the first being by broad-casting, the second is by sowing the seed in the open with no covering in drills of from eight to twelve inches wide, leaving about a six to eight inch space between each drill for the running of water, which insures stockier and hardier plants than by the broad-cast method in beds and is followed exclusively by the San Dimas Citrus Nurseries. In taking up the seed-bed plants for nursery planting, it is well to thoroughly wet down the bed so as to insure getting all the fibrous roots possible, and in loosening the plants it is best to use a four or five-tine spading fork, or other suitable instrument, first discarding for purpose of planting in the nursery row all weak and inferior plants. We plant all our budded stock about fifteen inches apart in the row, and the rows four feet apart; this insures a strong, robust and vigorous tree, as it allows of liberal cultivation, irrigation and all the essential operations to accelerate growth. Very little pruning is practiced, except to rub off the sprouts some six to eight inches above the surface of the ground.

After the budding has been properly done, we leave the strings or wax cloth on the trees from twenty-one to thirty days. After buds are thor-

Commercial sizes of citrus trees.

Reading from left to right, two-year buds caliper: **1**—1 inch and all up: **2**—$\frac{3}{4}$ to 1 inch: **3**—$\frac{5}{8}$ to $\frac{3}{4}$ inch.
One-year buds, caliper: **4**—$\frac{5}{8}$ inch and all up: **5**—$\frac{1}{2}$ to $\frac{5}{8}$ inch: **6**—$\frac{3}{8}$ to $\frac{1}{2}$ inch.

oughly set, tops are cut off or lopped. All of our trees are firmly staked before the bud begins to lop over with its own weight: this insures a straight tree of good habit and strong development. With us it is a custom to top all trees at a height of thirty-three inches, allowing them to limb down nine inches. This leaves a space of twenty-four inches from the lower limbs of the tree to the surface of the ground. Of late years the best planters prefer a lower headed tree than formerly. This method of topping makes a tree much stockier, which will withstand the wind much better. A low headed tree of this description also has the advantage of shading its own trunk from

Two-year-old seed bed stock.
Showing growth of 30 inches 18 months from planting.

the rays of the sun when it is young and tender and in its first stages of development. Before the tree is removed from the nursery to the orchard it should be properly cut back. This usually consists of lopping off about one-half of the top, though some allowance must be made for condition of the tree, if balled or open roots, and the weather. It is of great importance, however, that the tree should be properly pruned before transplanting. Too much foliage will cause a greater evaporation than the roots can stand.

Methods of Transplanting.—There are two methods of transplanting nursery trees to orchard form, viz., the open root and the balling system. In following the former method a trench is first dug alongside of the tree to the depth at which the tap roots are to be cut. The soil should be well irrigated before the tree is taken out to avoid breaking any of the fibrous roots or disturbing any of the root system during the process of removing the tree. After the trench is dug and the tap root cut, a spade is forced down on the opposite side of the tree from the trench at a sufficient distance away to avoid disturbing any of the root system; the tree is then pried carefully into the trench and the earth shaken off the roots. The roots should then be immediately covered with a wet cloth or burlap to protect them from the sun until the tree can be sledded out to the end of the nursery and loaded in wagons or taken to the packing house. Before boxing trees taken up in this manner or loading them on wagons to be hauled

A perfectly grown two-year-old budded tree.

away, it is a good plan to dip the roots into a mixture of earth and water of about the consistency of paint. This will cling to the roots and thoroughly protect them from the sun and wind. A place to dip the trees can be prepared by digging a hole in the ground some two or three feet deep and of the width required, pouring in water and stirring with loose earth until the right thickness of the mixture is obtained.

the planter, who holds it in position for planting, placing tree to the same depth as originally in the nursery row. During this operation one or two men are employed to fill in the hole with good soil while the planter spreads the roots out carefully in their natural position. The earth for filling in must be moist (if not it should be irrigated where the holes come before planting) so the roots will not be dry by the time the water is applied. After they are

One million seed bed stock grown in the open, nine months from planting.

The tree is now ready to be packed in wagons or boxes for shipment by freight, express, or parcels post. If it is to be planted in the near neighborhood, it is packed in wet straw in wagons, but if for shipment it is removed to the packing house and there carefully packed in damp moss in boxes. In loading in wagons, after the roots are well covered or packed in wet straw the tops should be covered over with a canvas or something of this description to keep off the wind and sun. A great many planters prefer their trees taken up in this manner, as it insures a much larger root system.

After the holes have been properly dug in the orchard, the driver hands out one tree at a time to

covered to a sufficient depth, the planter presses the soil carefully around the tree and it is then ready for the water, which should not be more than ten to twenty minutes behind the planting. The sooner the water is applied the better it will be for the tree. The soil around the tree should be thoroughly wet to exclude the air and insure it being properly settled around the roots. After irrigating, it is necessary to go over it again before the ground is thoroughly settled to straighten it up in its natural position, as the settling of the earth is apt to cause it to lean out of line. After the tree has been thoroughly irrigated it is necessary to go over it again with the water in the course of a week or ten days, depending

on the condition of the soil and the weather. After this, all conditions being favorable, it will stand thirty days between irrigations.

In following the balling method of transplanting, a trench is dug alongside of the tree within six inches of it and to the proper depth, the tap root then being cut off at the length desired. With a sharp spade the baller then cuts the earth away from the tree, leaving whatever is required for the proper size of the ball. This leaves the roots undisturbed. The baller then carefully lifts the tree out of the trench and places it on a piece of burlap cut to the required size, while his assistant carefully lifts up the ends of the burlap around the top of the ball and ties it up with binder twine or something to answer the purpose and of sufficient strength. By this method the ball is kept from breaking or being shaken up in handling. In all cases where the seedling stock budded is large or small, it is necessary before tying up the ball to cut the tap root off even with the bottom of the ball with a pair of sharp pruning shears. When trees are balled, they will seldom wilt or lose their foliage. The planting of balled trees is carried on in very much the same manner as the open root method, with the exception that it is not necessary to have the water applied so soon. The ball will hold the moisture for quite a length of time. It is best, however, to put the water on as soon as possible, but it is not near so important as with the open root trees. Trees can be handled with much more safety by the balling method of transplanting, and with less risk of loss after removing. Do not plant too deep; trees will settle after being irrigated from one to two inches or more. When finally "set" the trees should stand to the same depth as they originally appeared in the nursery row. When planting balled trees, before final straightening up, cut the string when the hole is one-half to two-thirds filled with soil, turn back the burlap, and then fill in to the surface. This allows of free growth, and in after cultivation obviates any liable damage by contact while the tree is becoming thoroughly cultivated.

A block of one hundred thousand one-year-old budded citrus trees.

Laying off the Ground for Planting.—When the nursery trees are ready for planting in orchard form, using a five acre plot for example, planting twenty feet apart on the square method, it will be necessary to run three headlines, one across each end and one through the center, putting in stakes every twenty feet, commencing at one end first and leaving plenty of room between the first row and the end of the plot for turning purposes in cultivation.

After the headlines are run across each end it is necessary then to stretch a wire lengthwise of the plot, being careful to have it perfectly straight. After this is done stakes should be set every twenty feet along the wire, which will mark the center of the hole to be dug. After the plot has all been staked off in this manner and the holes dug with the necessary preparations for planting, a board

should be taken—something about 1x4, three to four feet long—with a notch cut in the center of one side and one at each end. The center notch should be placed where the tree stake stands with smaller stakes at each end before the holes are dug. This will admit of removing the center stake while digging the hole, and in planting the board can be placed over the hole with the notches on each of the end stakes, the center notch being where the body of the tree should stand. This board should be left on the tree while filling in the earth, and by following this method all of the trees will be perfectly in line by straightening up after irrigating before the soil becomes packed.

Best Time to Plant.—The orange tree being evergreen, it can be planted with more or less success at almost any time of the year; but it has its periods of activity and dormancy more or less, hence the condition of the tree should be considered. In transplanting it is advisable to take the trees when least active in growth, because the shock of removal is less severe at such times than when in an active state. In our judgment the best time to plant is in the spring and early summer, when the soil has become aerated and warmed by the sun, and the cold weather of winter has ceased. It is the judgment of many of our leading orchardists that April, May, June and July are the ideal months in which to plant and establish a lemon or orange grove.

Precocious rows of one-year-old Washington Navels, showing blooming and fruiting qualities.

Transporting citrus trees by auto truck.

THE CALL OF THE SOIL AND TREE

WHILE it is true that the orange and the lemon enjoy a wide geographical distribution, not only in California, but in various other of the sub-tropical regions of the earth's surface, nevertheless commercial production is after all limited to peculiar conditions and environment, based on character of climate and soil. Though classed as fruits of the tropics, they attain their greatest perfection in those regions bordering the temperate zones known as arid, or where the rainfall is somewhat scant and sunshine largely predominates. Thus, the orange tree of the tropics, where rainfall is abundant, grows luxuriantly, but the fruit is insipid, wholly devoid of the fine citrous quality of that grown in regions temperamentally contiguous to a more rigorous climate. For these reasons we find citrus culture assuming commercial importance only where the climate hovers at the danger point and where the rainfall is scant, rendering irrigation a necessity, and sunshine predominates during the growing and ripening period. Cloudy and damp weather produces pulpy fruit, while sunshine evaporates the moisture and checks rank growth, superinduces the ripening process, creating a fine exterior, abundant juice, sweetness and flavor. Within its sphere of widest production, these conditions are again subject to varying degrees, not only as applied to the industry as a whole, but also as applied to particular varieties. Citrus fruits should never be planted where biting frosts are reasonably frequent. A drop in the temperature to 25 or 26 Fahrenheit covering a period of several hours is fatal to the crop. Between this and a lesser degree, there is a wide range, not without its hazards of occasionally fatal cold spells, but where fruit of very high quality is being constantly produced. Allowing for this, it is obvious that the area based on climate capable of growing citrus fruits in California is indeed a wide one; in a much lesser degree, the same is true of Arizona, southwestern Texas, and other orange and lemon growing sections.

Our exhibit of citrus trees for St. Louis World's Fair as it appeared ready for shipment.

Hence, it is important that local conditions of temperature should be carefully noted by intending planters, especially if the citrus industry is new to the section to be exploited. Possibly something should also be said of climatic conditions as applied to time of ripening, and also the effects on certain varieties and species. As an instance of this, it is noticeable that the major portion of the lemons marketed in the summer months are the product of those orchards situated in the Coast counties of Southern California located sufficiently inland where the climate is tempered by the prevailing ocean breeze; in the interior valleys the crop matures in the fall, extending into the winter months. Likewise, the foothill regions of the interior valleys whose climate is tempered by the mountain breezes, grow better lemons than are produced on the floors of the valleys. Intermediate between these there is almost every grade of weather condition, often resulting in the production of the poorest and also the best of citrus fruits, but at some hazard to growers.

Soils. To arrive at an intelligent consideration of soil as applied to citrus culture, we should first understand the requirements of our orange or lemon grove. Broadly, citrus fruits will do well on a variety of soils; specifically there are certain fundamentals that must pertain to a good soil, or failure will be inevitable. Soil to be of any use must be sufficiently loose and porous to allow the roots to grow and extend freely, nor yet so open as to cause rapid evaporation of moisture or their easy disturbance by atmospheric action. All vegetation requires more or less water, hence the water-holding capacity of the soil is also of importance; but it must possess drainage. A soil that holds too much becomes waterlogged, a condition fatal to tree growth. Temperature is another important factor; a soil that is a "low" or "cold" is undesirable. Obviously it should be deep, so as to allow of extensive root development. These essentials have to do with the *physical* condition of the soil which we regard of equal importance with its fertility. Hence, see to it that your land is first in physical condition for the production of citrus fruits. Plant food is usually present in sufficient quantity for the production of a crop, though it may not always be available nor in sufficient quantity for the growth of commercial crops. Technically, citrus soils in California are recognized under various names, such as sandy loams, clay loams, granitic foothill soils, dry bog soils, adobe soils, mesa soils and gravelly alluvium. Any of these placed in good physical condition and rightly situated in what are known as citrus belts, will grow good fruit. Sand and gravel as such are to be avoided, and a hardpan (unless first blasted up by dynamite) is adverse to a healthy orchard. A good subsoil of a granitic formation, well rotted, is best. It should be fine but pervious to water. On another page we treat on the subjects of irrigation and fertilization, to which the reader's attention is directed.

The Trees.—In making a selection of your trees, be careful to secure only the best; a poor specimen is an expensive luxury even as a gift, and will never repay cost of care and cultivation. Bear in mind that we put out only clean, healthy, well-grown and vigorous stock, true to name and up to every requirement calculated to produce with reasonable care and cultivation, profitable crops of merchantable fruit. This purchasers can always depend on. Our total acreage in trees is now over 250 acres, all of which is devoted exclusively to citrus trees of our own growing.

Setting Out the Orchard.—Having the right kind of soil in the proper condition, with true-to-name and well-grown trees, we may with safety proceed to plant. In doing so, exercise care in having your orchard symmetrical in order to economize the area to be planted. There are several methods or systems whereby this may be attained, and in order to make them clear and better understood, we here present illustrations of square, quincunx, hexagonal and triangular methods.

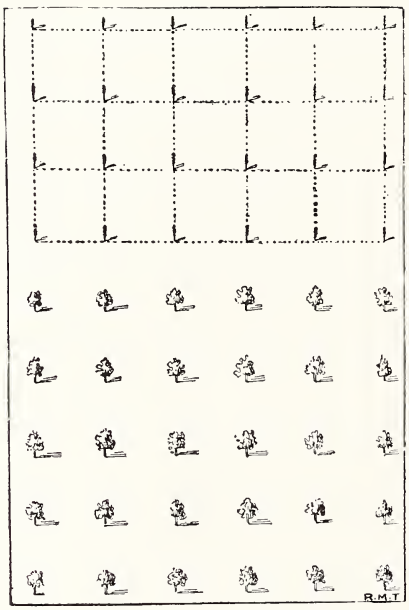
The Square System.—This is the most approved method. The orchard is laid off in lines crossing each other, with equal intervals of space, and a tree is planted at each crossing of lines. By the square method, at 20 feet apart, 108 trees are planted to the acre. The preferable distances for planting are 20 feet for dwarf varieties, 24 feet for Navels and Mediterranean Sweets, and 30 feet for all seedling types.

One-year-old budded citrus tree.

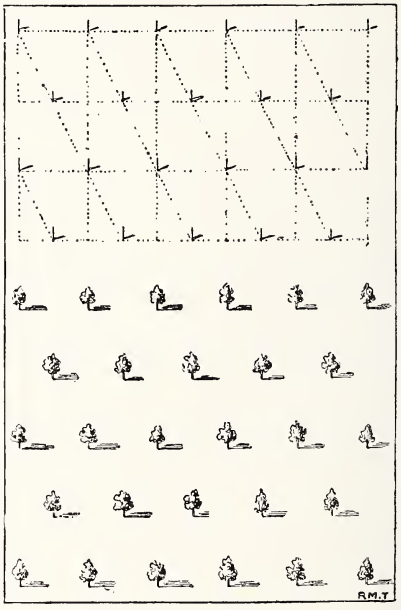
Quincunx System.—In this system the orchard is laid off in the same manner as for square planting, except that the number of rows are doubled, and a tree planted in the center of every square. This method is chiefly used in planting with the idea of removing the center trees after those designed to be permanent shall have attained a considerable size; the orchard then assumes the square plan. At 20 feet apart, 199 trees are planted to an acre by this method.

Hexagonal, or Septuple, System.—In this system the trees are equilateral (equally distant from each other) and more completely fill the space than any other system can. Six trees form a hexagon and enclose a seventh. The lines in the figure indicate the method of laying out the orchard. By the hexagonal system, at 20 feet apart, 126 trees are planted to the acre.

Methods and Care.—An orange or lemon grove can, without exaggeration, be viewed in the light of a manufacturing plant engaged in the production on a commercial scale of a fruit product; the trees are so many employees receiving a certain wage as cost of maintenance, over whom the owners or managers should exercise a supervision that will call out the maximum of efficiency. To do this successfully will require a minute and individual acquaintance with each inhabitant or employee of the orchard, so that it may do its work well, and not be wanting in any of the things that stand for success in the making of a high-grade article of orange or lemon. The basic operations of cultivation, irrigation, manuring and harvesting are treated on elsewhere in this book; what is here meant by "methods and care" covers some of the minor things that have an influence for the development and maintenance of a successful citrus fruit business.



Square system.



Triangular or alternate system.

The following table will show the number of trees to the acre by the square, quincunx, and hexagonal, or septuple, systems:

Distance Apart	Square	Hexagonal or Septuple	Quincunx
10 feet	436	500	831
12 feet	303	347	571
14 feet	222	255	415
16 feet	170	195	313
18 feet	134	154	247
20 feet	108	126	199
22 feet	90	103	173
24 feet	76	96	137
30 feet	48	56	83

Note.—In giving the distances of trees of the quincunx, the fifth or central tree is not taken into account.

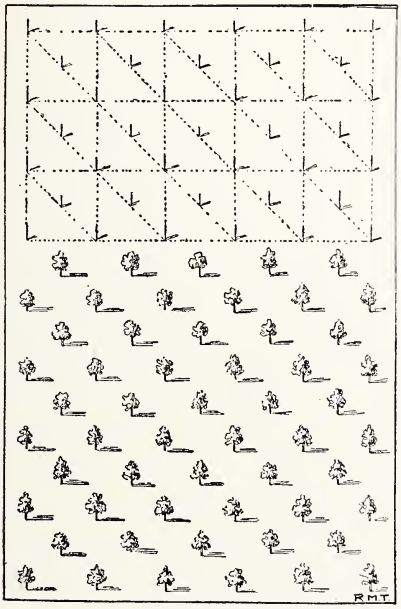
The successful grower "knows his trees," and for this reason he will not tolerate any drones in his orchard. By careful observation he soon learns to know efficiency in quality and production, and either brings up the efficiency of the laggard tree to the proper standard, or "discharges" the delinquent.

"Catch crops" can be grown between the rows of

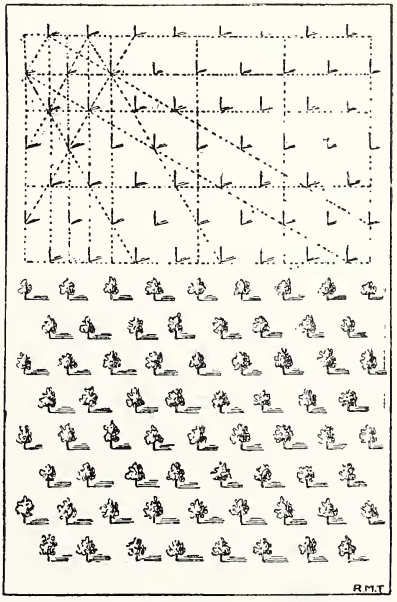
young trees for a few years, until they show bearing capacity. In this way the beginner can find some source of income during the waiting period for his trees to fruit. These crops should preferably be annuals—corn, melons, beans, peas, potatoes, and general kitchen vegetables often prove acceptable.

Since humus not only enhances the physical condition of the soil but also adds elements of plant food, it is important to conserve and utilize all the vegetable matter available. Owing to this, we advise the practice of cutting into small particles, of from four to six inches in length, the young trimmings when pruning the trees as a green manure by plowing or cultivating the same into the soil. It is really quite astonishing to observe how readily these become assimilated, even the young wood decaying within less than a year's time, and the tender tips and leaves in a much shorter period. Orchards under like conditions so treated will be found to present a healthier appearance than those where the tree prunings have been taken off the land and otherwise disposed of. In cases where the orchards are large, the prunings may be chopped or cut up by machinery, but in smaller holdings it is no great task to cut them up by hand. In either case the best results will follow if cut up at once after leaving the trees and cultivated or plowed under before serious drying out takes place.

Open irrigation ditches are not so good nor so economical in the long run as a good system of piping.



Quincunx system.



Hexagonal or septuple system.

Good tools in always prime condition are another essential. A good horse or team, a wagon, cultivator, walking plow, pony gang, disk harrow, or spring tooth, and of course the general line of hand garden tools are some of the incidental equipment that, when properly used, stand for success.

A few standard books on citrus culture should be a feature of every orchardist. Among such can be recommended Wickson's "California Fruits and How to Grow Them"; Hume's "Citrus Fruits and Their Culture"; "Soil Fertility and Permanent Agriculture"; and the several bulletins of the Agricultural Experiment Station at Berkeley, and those of the State Horticultural Commission at Sacramento, bearing on tropical fruit growing.

SUGGESTIONS TO INTENDING PLANTERS

INTENDING planters when ordering trees will expedite the filling of orders and be doing us a favor by observing the following:

How To Order. State specifically the size and variety of trees you want, and also give a few general hints as to your soil and climatic conditions.

Quality of Stock. All of our trees are grown to stakes, and are straight and thrifty, budded at the ground and well rooted. Good stock is the foundation of success. He who plants an orange or a lemon grove plants for generations; hence, in choosing stock be careful to get only the best obtainable.

One-year-old buds balled and stored for curing.

From unknown parties we demand a remittance or deposit of 25 per cent of order, or good references. Send money by bank draft, postoffice or express order, or registered letter.

Location. The land upon which our nurseries are situated is conceded to be the best for growing citrus nursery stock, producing a fine grade of tree, with a root system of great vigor, making transplanting safe and easy.

Guaranteeing Trees. We guarantee all trees shipped from our nurseries to be as represented. We personally attend to the budding of all our trees, and use the utmost care to insure them true to name.

Packing. We pack all trees in the best possible manner known to the trade, in bales and boxes, according to size of order and distance of shipment. Trees can be sent with safety to any part of the

United States or foreign countries. We make a small charge for packing, just sufficient to cover cost of material. Sample trees furnished intending buyers.

Transportation Facilities. Our transportation facilities are excellent, being midway between the Southern Pacific and Santa Fe railways and the Pacific Electric Railway; hence we ship via any one of the three.

thus are able to offer any size that is required. We have buds one, two and three years old. Quality considered, we have citrus trees of all grades, and are able to meet competition from whatever source. Prices on application.

Booking Orders Ahead. The demand for trees promises to be unusually active, hence it is advisable for intending purchasers to place their orders early, and thus insure good stock and be assured of having

Valencia Late grove, twenty-two years planted. Crop sold in 1911 for $2,600 per acre gross.

Shipping Instructions. Please furnish explicit directions for shipping and by what route. In the absence of any instructions we ship according to our best judgment, but in no case do we assume any responsibility for condition or safe delivery of trees after same have been properly packed and delivered to transportation companies.

Price. The matter of price depends somewhat on size of trees, quality of stock, variety, etc. We sell according to condition of stock and customer's wants. We grade our citrus stock by caliper, measurement being made one inch above the bud, and their wants satisfied. We book orders ahead, and take every precaution to protect our customers, both in the way of reserving the trees as well as in the matter of quality. Write us for prices and particulars.

True to Name. Our trees are all budded from bearing trees and every precaution exercised to have them true to name. We guarantee all stock sent out to be well rooted, well grown, true to name, properly packed, and shipped according to instructions. Our liability under the foregoing guarantee is limited in amount to the original price received.

THE TRIED AND APPROVED VARIETIES

IN California commercial varieties of citrus fruits have been limited to a few standard sorts, which are enumerated in the following classification. The descriptions and history of each has been carefully verified, and hence may be accepted as reliable and to the point.

THE SWEET ORANGES

WASHINGTON NAVEL

Fruit. The Washington Navel stands at the head of California oranges. Fruit large to very large; peel invariably smooth and thick, rendering it of good protective quality; color a pronounced orange yellow; fruit marked at

Washington Navel orange.

the blossom end with a small but irregular and secondary orange, from which it takes the name of "Navel"; fruit seedless and free from "rag"; flesh crisp and sweet, with abundant juice possessing a flavor peculiarly its own; shipping qualities of the best, "standing up" under long distance shipments and yet maintaining its fine eating values.

Tree. Of a rather moderate growth with small or no thorns and somewhat umbrageous in character with full rounded top; foliage a dark glossy green liberally furnished; in California a strong and regular bearer, often producing fruit the second year in orchard form from the nursery rows.

History. This fruit was introduced into the United States in 1870 by the Federal Department of Agriculture under the name of the Bahia orange. Of the trees propagated by the Department two were sent to Mrs. L. C. Tibbets of Riverside in 1873: an event that can truthfully be said to constitute the founding of the orange industry in California. Originally the fruit was known as the Riverside Navel, but as it became known in other localities, the name was changed to Washington Navel, in honor of the Federal Capitol from which it was first sent out. The original two trees are still alive. One was transplanted in 1913, with the assistance of ex-Pres. Roosevelt, to the court of the Riverside Mission Inn Hotel; the other still stands at the head of Magnolia avenue. Of this tree we show an illustration on another page of this book.

VALENCIA LATE

Fruit. Owing to its season, which extends from May to November, this variety is second only to the Washington Navel in commercial importance. The fruit is of medium size, slightly oval; color a good orange yellow; peel thin, smooth and of good protective quality; flesh of good grain

Prolific Valencia Late orange.

with abundant juice of fine citrous flavor; practically seedless; shipping quality of the very best. The Valencia Late is the best summer shipping orange known to commerce, and coming into market at a season of the year when all other varieties have been disposed of, is essentially in a class by itself and exempt from competition.

Tree. Splendid form and of vigorous upright growth, attaining to great size much like the seedling type of an earlier period of the citrus industry; almost thornless; its extensive planting can be commended on good citrus lands that are reasonably free from late biting frosts.

History. This fruit is a synonym of Hart's Late and Hart's Tardiff, and was introduced into California from Florida in the early seventies. Among our earlier experiences with citrus culture, we recall an orchard planted to Hart's Tardiff trees, which on coming into bearing developed a number of trees untrue to name. These we budded to Valencia Lates, which on coming into bearing, fruit and habit of trees were identical with the Hart's Tardiff.

THOMSON NAVEL

Fruit. The Year Book of the Department of Agriculture for 1911 gives the following description: Form slightly oblong; size above medium to large; cavity small, surface smooth; stem slender; color orange yellow, reddening somewhat after picking; peel relatively smooth, rather closely adherent, usually thin and rather tender; segements

Thomson's Improved Navel orange.

10 to 12, irregular in size with open center; flesh, rich yellow to deep orange in color, translucent, moderately tender; not very abundant; seedless; flavor sweet, sprightly, pleasant; quality good, but not equal to the Washington Navel when the latter is well grown. Its shipping season is about the same as that of the Washington Navel, but it reaches full maturity about one month earlier than that variety.

Tree. In habit and appearance very much like the Washington Navel; a good grower, stronge foliage, and well branched.

History. This fruit takes its name from that of the man (Mr. A. C. Thomson) on whose grounds it was first observed. Its origin from a scientific point of view was a matter of much speculation in the early days of the citrus industry in California; but of late years it is quite generally conceded that it took its inception as a bud sport of the Washington Navel, rather than through any process or manipulation of buds.

GOLDEN BUCKEYE NAVEL

Fruit. The feature that distinguishes it from all other varieties of Navel is a series of ridges of a deeper orange color on the peel, which is smooth and of a kidglove texture; flavor strongly aromatic, with a suggestion of pineapple; pulp of fine texture with but few segments; almost entirely free from rag; a good keeper and shipper; its earliness (January to May) gives it commercial rank; medium size.

Golden Buckeye Navel orange.

Tree. A good grower; thornless; leaves lanceolate, much more so than the general run of orange trees, and only slightly serrated and dark green in color; new wood inclined to grow slender but of good strength; general habit and appearance of tree strikingly individual.

History. This is another "sport" discovered in our growing orchards. Owing to the handsome and variagated exterior, often showing a narrow ridge of Washington Navel peel, combined with its fine eating qualities, induced us to propagate it and give it place in our published list of desirable varieties.

GOLDEN NUGGET NAVEL

Fruit. Medium to large, solid and of good shape; peel thin, more so than that of the Washington Navel, of fine texture, surface being smooth to the touch, and of good color; flesh exceptionally free from rag and seedless; flavor of the best with abundant juice; a good shipper. Season February to May.

Tree. Somewhat individual by reason of its exceptionally dark green foliage, abundant lateral or fruiting branches, and fine symmetrical appearance; foliage is more lanceolate than that of the Washington Navel, and in color a shade darker, not quite so broad nor apparently quite so thick or leathery; wood growth, particularly the younger branches, more slender and willowy.

History. A variation or "sport" originated in our orchards some years ago, which appealed so strongly as to its economic importance that we have taken buds from the parent tree and perpetuated the strain under the name of "Golden Nugget Navel." Possessing real merit, it is worthy of trial culture.

NAVELENCIA

Fruit. In appearance much like the Thomson Navel, being of good size and shape; peel of fine grain and rather

Golden Nugget Navel orange.

thin; flesh melting to the taste and reasonably free from "rag"; juice abundant and of good flavor; shipping quality up to standard. Season, January to June.

Navelencia orange.

Tree. Of an unbrageous habit with fine symmetrical top; possesses small thorns; foliage dark green and glossy; an early and good bearer, often yielding fruit the second year from the bud.

History. The claim that it is a cross between Thomson Navel and Valencia Late is hardly tenable; it probably is a variation in the regular Navel type of sufficient importance to give it specific rank. Not extensively cultivated as a commercial sort.

MEDITERRANEAN SWEET

Fruit. Medium to large; shape oval; color a rich orange yellow; peel rather heavy and of good protective quality; flesh of good grain and orange yellow in color; flavor sweet and aromatic; a good shipping variety; season between Washington Navel and Valencia, usually from April to July.

Mediterranean Sweet orange.

Tree. A good bearer and vigorous grower inclined to a spreading habit but not attaining great size; practically thornless; will stand a slightly colder temperature than some of the other sorts; at one time extensively planted in Southern California, but of late years planted sparingly.

History. Of European extraction and first introduced and disseminated in California by A. T. Garey in the late seventies and early eighties.

PAPER RIND ST. MICHAEL

Fruit. Rather small, round, solid and heavy; peel smooth, thin and of fine texture; color yellow verging to a lemon shade; membranes thin; grain of fine texture; juice abundant; flavor sweet and sprightly; good shipping quality. Season, April to June.

Tree. Strong and upright grower; medium thorny; a good bearer. St. Michael trees in the Azores, in sheltered situations, have been known to bear from 15,000 to 20,000 fruits in a single year.

History. One of the oldest varieties in cultivation in the Mediterranean countries and in the Azores, where it has long been a favorite. First planted in California in the earlier stages of the exploitation and development of the citrus industry.

Paper Rind St. Michæl orange.

RUBY BLOOD

Fruit. Of medium size and round in shape; peel thin and inclined to be tough; pulp melting, juicy and of a rich acidulous flavor; flesh a ruby red as the fruit fully matures, showing through the peel, giving it a reddish blush on the outside; a fruit of prime quality in its class.

Tree. Nearly thornless, a good grower and prolific bearer; habit symmetrical and beautiful to the eye.

History. An imported variety, undoubtedly from some of the Mediterranean citrus districts. Introduced into Florida by General Sanford, from whence it undoubtedly found its way to California.

SWEET SEVILLE

Fruit. In size from small to medium; flavor delightfully sweet and pleasant; peel thin and smooth; color a strong yellow. Season February to March.

Tree. A good grower, prolific, and bears when quite young.

History. Another introduction from Florida.

THE MANDARIN ORANGES

DANCY TANGERINE

Fruit. Of medium size; color bright shiny orange red; peel smooth, thin and leathery, being easily removed; flesh dark orange color, rather coarse grained; juice abundant and somewhat colored; flesh melting and free from "rag"; flavor pungent and sprightly; seeds from 6 to 18. Season February to May.

Ruby Blood orange.

Tree. Strong upright grower, resembling in habit a seedling orange; when bearing heavily has a slight tendency to spread at top, which can be avoided by proper pruning; unlike most of its family, has a broad leaf, much like the standard oranges; well grown the tree makes a handsome appearance with its intensely colored fruits; to enhance size and quality of fruit, it should be thinned out.

Foliage and fruit of the Ruby Blood orange.

History. It is generally supposed that Dancy is a seedling from China. In this country the variety was undoubtedly disseminated in Florida, from whence it found its way to California. It was known as early as 1843. Cuttings of trees propagated from this original planting strongly resemble the Dancy as we know it today.

KING MANDARIN

Fruit. Very large and flattened with loosely adhering peel and segments; color bright orange red; peel rough but of good appearance; pulp melting and free from rag; flavor peculiarly aromatic and agreeable; seeds 15 to 20 in number; general qualities of the very best. Season June to August.

Tree. Rather rigid and upright in growth; foliage a rich dark green color; generally quite thorny.

History. Introduced into California from Cochin China in 1882 by Dr. R. Magee of Riverside.

WILLOW LEAVED MANDARIN.

Fruit. Medium size, flattened; deep yellow; skin thin; segments loosely adherent; flesh dark orange-yellow, spicy and aromatic. Highly esteemed for eating out of hand because peel separates readily from the pulp; rated as one of the best of the kid glove type.

Willow-Leaved Mandarin orange.

Tree. A compact grower, forming a beautiful unbrageous head, hence exceedingly desirable as an ornamental feature of the orchard or garden.

History. Introduced from Italy into Louisiana in about 1845, from which State it has been disseminated throughout Florida and California.

Oonshiu or Satsuma orange.

Spray of Dancy Tangerine orange.

King Mandarin orange.

SATSUMA: OONSHIU, KII SEEDLESS

Fruit. Medium, flattened; the color is not red, like the Dancy Tangerine, but a deeper yellow than the Mandarin; rind and segments part freely; flesh fine-grained, tender, juicy, sweet and delicious; entirely seedless. Season November to April.

Tree. Thornless and of spreading dwarf habit; leaves narrow; branches reclinate; a slow grower and bears young.

History. The Satsuma is a Japanese sort, and is said to have been first introduced into Florida in 1876 by Dr. Geo. R. Hall, and later (1878) by Mrs. Van Valkenberg. It first attracted attention in California in the eighties.

KUMQUAT

Fruit. About an inch long and olive or egg-shaped; color a rich golden yellow; peel (which is edible) smooth, aromatic and spicy to the taste; juice somewhat sparse but acidulous; sections usually five; seeds two to five. The whole fruit, rind and all, is eaten, and people become very fond of it. Preserved in sugar or crystalized the Kumquat, wherever it is known, is deservedly popular.

Nagami Kumquat orange.

Tree. Dwarf and bushy in habit; usually when full grown 8 to 12 feet in diameter; forming a shapely head, rendering it an ornament as a tub plant or placed in the garden. An enormous bearer, which retains its fruit for months, giving it an added appearance of beauty as well as utility.

History. Downing in his Horticulturist for February, 1850, makes mention of the Kumquat as a greenhouse plant. At a later period it undoubtedly found its way into Florida. Reasoner Brothers imported the egg-shaped variety in 1885 and the round (known as Nagami) in 1890. During the rapid development of our citrus industry from about 1875 to 1895, this fruit undoubtedly found its way, with many others, to California from Florida.

THE ORNAMENTAL ORANGE

BOUQUET DES FLEURS

Fruit. Medium size; peel like that of the King orange; color orange yellow; a fine marmalade is made of the fruit by slicing as a whole; also the Bergamot oil of commerce.

Tree. Distinct in appearance, owing to the peculiar shape of its leaves, which are round, thick, leathery, compactly and densely furnished; flowers large and in clusters; free bloomer.

History. An introduction from the south of Europe; worthy of recognition on account of its oddity as well as economic values.

GOLDEN VARIEGATED

Fruit. In general characteristics very much like the Pomelo.

Tree. An ornamental acquisition with leaves of the same shape and design as the ordinary orange with the exception that they are beautifully marked with yellow configurations.

History. Brought from Europe by the late John Rock, of the California Nursery Company, and by it disseminated.

THE COMMERCIAL LEMONS

EUREKA

Fruit. In shape oblong and of medium size; peel of fine texture and good protective quality and rich yellow color; flavor of strong citrous quality; juice free and abundant, with but little "rag"; cures and keeps well, giving it high rank in the trade.

Eureka lemon.

Tree. Stalwart grower and comparatively free from thorns; prolific bearer, blooming and setting fruit continuously throughout the year, but especially a good cropper during the summer months.

History. Originated as a chance seedling in the grounds of Mr. C. R. Workman, from seed imported in 1872 from Hamburg. A few years later its fine qualities attracted Mr. Thomas A. Garey, one of the leading nurserymen of that day, who commenced to propagate large numbers of trees of this variety by budding, thus exploiting and pioneering the way to its dissemination pretty much over California, wherever the lemon finds congenial conditions.

Lisbon lemon.

VILLA FRANCA

Fruit. Size medium to large and oblong in form; peel smooth, of good texture and bright yellow in color with no trace of bitterness; flesh fine grained and translucent; juice abundant with little pulp; a high-grade commercial fruit.

Tree. Upright grower; practically thornless; branches spreading if not properly pruned; foliage abundant; a thrifty grower and good bearer, setting its fruit well into the protection of its own foliage.

History. The Villa Franca was introduced into this country by General Sanford, and first planted in Florida, where it soon made a place for itself. In the late eighties it was brought from Florida to California. In the former state it occupies first place as a commercial lemon.

LISBON

Fruit. Of recognized merit in the markets of the country; fruit of average size; peel smooth, sweet to the taste, pure lemon color, and of medium thickness; flesh fine grained, nearly transparent and abundant juice; flavor strongly acidulous and free from bitterness; practically seedless; keeping and shipping qualities of the best.

Tree. Of largest growth; thorny; strong vigorous grower well covered wiht foliage and a good bearer of fruit running uniform in size and even maturity.

History. The Lisbon is an importation from Portugal, and found its early exploitation and development in Riverside, where it was first made known by D. N. Burnham. In the earlier period of our citrus development it occupied the place of honor, but its position has been superceded by the Eureka.

VARIEGATED LEMON

Fruit. Average in size, mottled and streaked; juice good quality; color variegated; flesh somewhat pink in color.

Tree. Strikingly individual from the fact that its shining, lustrous foliage is beautifully veined and marked with strong yellow-colored configurations, which give it a royal and handsome appearance as a specimen plant in the garden or on the lawn.

History. Originated some years ago as a sport, and propagated in a small way solely for its ornamental values, which give it high rank in landscape effects.

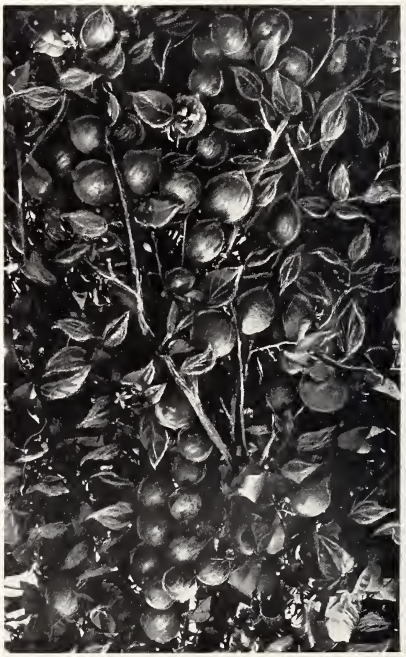
THE STANDARD LIMES

MEXICAN LIME

Fruit. Rather small in size, oblong or oval; color a pale lemon yellow; peel smooth and thin; flesh fine grained and grayish-green in color; juice abundant and translucent; acid strong; flavor decidedly that of the lime rather than lemon; almost seedless.

Tree. Medium and compact, growing from 10 to 25 feet in height; thorny; often cultivated as a hedge plant.

History. This variety was beyond question first introduced at an early period into Old Mexico by the Spaniards, from whence it found its way to California and Florida.



Prolific fruiting Villa Franca lemon tree.

TAHITI LIME

Fruit. Size of a small lemon, decidedly oval in shape; peel smooth and thin; flesh fine grained with a greenish tinge; juice plentiful and practically colorless; acid pure and strong; flavor of the best; seedless; also known as Bearss' Seedless.

Tree. Of good shape, 10 to 25 feet high, with a good spread of limbs; fruit produced singly and in clusters, well protected by foliage; slightly thorny.

History. An introduction from the Island of Tahiti.

THE COMMERCIAL POMELOS

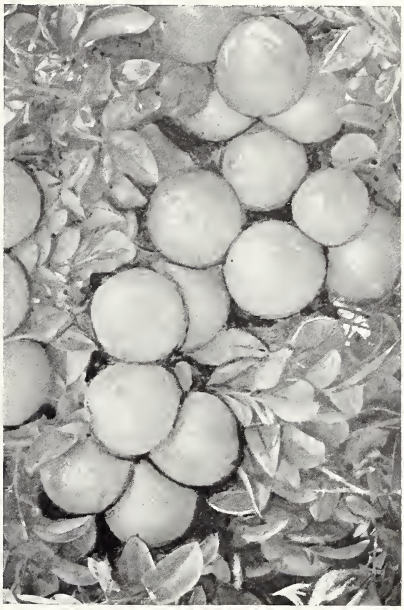
MARSH'S SEEDLESS POMELO

Fruit. Medium size; peel thin, with half the usual bitter; a true pomelo (grapefruit) and not a hybrid; practically seedless, specimens with merely rudimentary seeds being rare; juice abundant and of exceptionally fine flavor; flesh dark and rich. In serving you are not required to remove from 25 to 40 seeds, as is necessary with the common grapefruit, but is ready for the table when cut in halves; being devoid of seeds to germinate when left late on the trees or in storage, enhances its keeping qualities, which is a great factor in its favor; cures and keeps like the lemon.

Marsh Seedless pomelo.

Tree. Strong vigorous compact grower, and when at its best is indeed an object of beauty with its liberal furnishing of rich deep green foliage and great bunches of pure lemon yellow globe-shaped fruit; a good bearer; quality and flavor of fruit is greatly enhanced by liberal dressings of fertilizer to the soil; when setting a heavy crop, the fruit should be thinned out, thus affording the tree opportunity to perfect the remaining fruits, insuring quality, size and volume of juice.

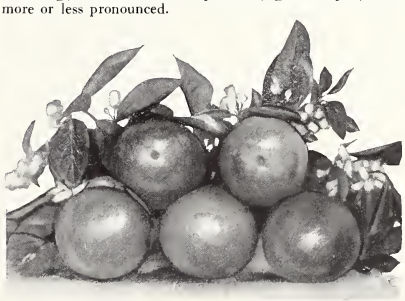
History. The Marsh Seedless Pomelo was originally introduced by Mr. C. M. Marsh, of Lakeland, Florida, in 1895-'96. The original tree was a seedling, and the fruit being without seed and of good flavor, at once brought it into public notice. Its introduction into California occurred about twenty years ago. The Shaddock, to which the pomelo belongs, is native to the Malayan and Polynesian Islands.



Fruit and foliage Marsh Seedless pomelo.

IMPERIAL

Fruit. Very similar to the Marsh Seedless in size, shape and color; peel smooth and fine grained; juice abundant; little rag; flavor sweet and pleasant; good keeper; seeds more or less pronounced.



Imperial pomelo.

Tree. A strong upright compact grower; fruit well distributed throughout the bearing surface; fruits from second to third year after tree has been planted in orchard form; habit good, making a fine symmetrical appearance, true to the pomelo type.

History. A chance Florida introduction, given the name Imperial, in California.

A well grown Washington Navel orange grove.

SAMPSON TANGELO

Fruit. Compressed-spherical, slightly drawn out at stem end like tangerine; of medium size, color chrome yellow, considerably darker than the pomelo, though not so red as the tangerine; skin thin, about one-eighth of an inch in thickness, loose and easily removable; surface smooth and glossy; segments 9 to 11, separating easily like tangerine; membranes thin and tender; rag very slight; quality excellent; texture very tender and juicy; flavor slightly subacid, somewhat sweeter than pomelo, medium in size.

Tree. A vigorous, strong upright grower, and in the opinion of its originators will prove productive; no hardier than either of its parents, the Dancy Tangerine and ordinary pomelo; foliage more like the latter than the former.

History. The hybrid seedling from which this variety was developed was grown and fruited by Mr. F. G. Sampson of Boardman, Florida. On the suggestion of the Department of Agriculture at Washington, we have adopted the name of "Sampson Tangelo."

TRIUMPH POMELO

Fruit. Medium; peel smooth, clear, thin and fine grained; less "rag" than in most grapefruits, and fewer seeds; very heavy; juicy and well flavored. There is no bitter in the juice, flesh or membranes surrounding the cells and dividing the segments, and very little in the white inner lining of the peel. Like the preceding, the fruit cures and keeps equally as well as the lemon.

Tree. Of good habit and comes into bearing young; prolific. Among the best of the later introductions.

History. The original Triumph Pomelo is said to have been a chance seedling discovered in the grounds of the Orange Grove Hotel at Tampa, Florida. Its commercial dissemnation dates from about the year 1885; some years later it found its way to Southern California, and soon attained rank with shippers as well as growers.

THE CITRON OF COMMERCE

THE CITRON: CITRUS MEDICA CEDRA

Fruit. Oblong, and conical in shape; skin thick, warty and furrowed in some varieties, while smooth in others; color lemon yellow and highly scented; pulp less acid than the lemon. The Citron of Commerce is manufactured of this fruit, and it also yields an essential oil. The amount of citron rind sold in the United States amounts to 12,000 cases of 250 pounds each, every ounce of which is imported. Its manufacture in California has been demonstrated.

Tree. Rather dwarf in habit, and inclined to sprawl, but with its large light green foliage makes a very presentable appearance; it is somewhat susceptible to frost; fruits and blossoms throughout the year.

History. Introduced into California both by private enterprise and on the initiative of the Department of Agriculture at Washington.

Furrow system of irrigation.

IRRIGATING THE CITRUS ORCHARD

IN CALIFORNIA citrus culture is only possible where there is available plenty of water for irrigating purposes over the dry summer and fall months.

In this connection there are three methods, viz., the furrow, the basin and the zig-zag systems. Our illustrations give a clear idea of the practical working phases of each. As the name implies, the furrow system consists of several furrows plowed between the rows of trees, and down these the water is allowed to flow gradually until the ground is thoroughly saturated. In furrow irrigation the water should be allowed to run very slowly in order to percolate through the soil to a considerable depth and at the same time prevent its washing down and leaching out the ground.

Basin system of irrigation.

The basin system consists in each tree being basined, an operation usually performed by a plow or what is known as a blocker or ridger, which consists of a V-shaped implement made of wood and iron or iron alone. This throws up a ridge or embankment of earth around each tree, which is allowed

Orange blossoms.

to fill with water from the main furrow or ditch once or twice. In this way the whole grove is treated, each basin being filled independently from the main furrow or ditch between the rows of trees which tap the main supply ditch.

The zig-zag system is an improvement on the basin system, and consists in the orchard being first cross-furrowed, then ridged lengthwise, as indicated in illustration shown on page 34. Its chief advantages consist in obviating a baking of the soil, especially if inclined to be heavy, by not covering the entire surface of the ground with water, thus affording sufficient dry earth to make a mulch when cultivated over the entire irrigated surface, an operation which can be done sooner after irrigation than in the basin system. This leaves the soil friable and at the same time conserves the moisture in the ground, which obviously is a great advantage over the basin system.

Irrigation on rolling or hilly ground is of itself quite an art, and is practiced by running furrows on the contour so as to guide the water without overflowing and thus flooding the soil. The artificial application of water to side hill orchards is only feasible by the furrow system in the manner indicated in the illustration.

It is an axiom among fruit growers in Southern California to first find your water and then look for a good piece of land on which to put it. This illustrates the importance of a reliable supply of water for irrigation purposes when planting and cultivating an orange grove.

Thorough and constant cultivation, rendering the soil friable and well communited tends to conserve moisture, at the same time enhancing the value of artificial watering. It is the practice of some growers to cultivate the land in three or more different directions, say two or three days after each irrigation, the aim being to establish a soil mulch from four to six inches deep. The more even and thoroughly the water is distributed over the whole surface of the ground, the better will be the action on the trees. In the groves of the San Dimas Citrus Nurseries we have followed these operations faithfully with satisfactory results.

Growers desiring wider information on the more technical features of irrigation as it applies to citrus culture should consult the bulletins of the Department of Agriculture and books of recognized value on the subject, of which there are a number to be had at the book stores.

Irrigating a hill side orchard by contour furrowing.

GOOD FRUIT AND SOIL FERTILITY

CITRUS growers who have attained success in the production of choice fruit from season to season, appreciate that the orange and lemon tree are gross feeders, and if good returns are to be maintained, some attention must be given to the matter of replenishing the soil with some of the ingredients that annual cropping removes more or less. In California, and for that matter in the arid regions quite generally, the soil is naturally rich, and when the tree is planted on virgin ground, it will do well without any application of fertilizer for the first few years, especially if given intensive cultivation; after that, however, some recognition must be given the orchard in this regard. Its extent and character is obviously a matter of local conditions, to which the intelligent grower will give careful attention, and act in compliance with the best practice of the successful and experienced growers in his locality. In sections where the soil is shallow it is expedient to apply a fertilizer every year from the time the orchard is planted. In the rich soils of California, it has been found that nearly all the subsidary elements of plant food are present, and hence only the four leading elements must be supplied, viz., nitrogen, phosphoric acid and potash, and in rare cases lime. These must be replaced in the soil of orchards subject to constant cropping. The intelligent grower, therefore, will be quite apt to see to it that his trees do not suffer for the want of nitrogen, phosphoric acid and potash, because these are the elements which the crop annually draws from the ground, and which must be replaced.

Citrus orchard planted to field peas for green manuring.

Valencia Late orchard, thirteen years old, planted to Teague trees, producing an average of 56,618 packed boxes per year for eleven years.

The experience of growers indicates that the quality and quantity of fruit may be somewhat controlled by fertilization, and as oranges are purchased entirely upon their appearance and quality, this becomes an important consideration throughout this region.

As a means to an end, the growing of cover crops, to be turned under as green manure, is advisable; this also adds humus to the soil, thus improving its physical condition as well as insuring an available supply of plant food. Cover crops are usually drilled in both ways, and irrigated during the early fall months, so as to insure a good stand. The legumes, Canada peas, vetch, etc., are the usual crops planted, which add nitrogen to the soil, and when plowed under, aerate it.

In planting vetch in the fall for a cover crop we have found it a good practice to sow barley or rye, preferably the latter, to shade the ground and afford supports for the vetch to vine on.

When commercial fertilizers are considered we are on more speculative ground, hence there is a wide divergence in practice even among the oldest and most experienced growers. The fertilizers used are dried blood, tankage, bat-guano and nitrate of soda for nitrogen; sulphate of potash for potash; and superphosphate of bone for phosphoric acid; stable manure is of course used in large quantities, and also grain or bean straw, preferably the latter. It might be added that cover crops and intensive cultivation greatly enhance the service and action of applications of commercial fertilizers to orchard soils.

No fruit grower whose crops and soil may suggest the need of plant food should be without Prof. Hilgard's work on "Soils," which goes into the subject exhaustively. As a result of constant annual cropping the matter of soil fertility and its maintenance looms large on the horticultural horizon, hence the urgent need of accurate knowledge and a more intelligent practice.

PRUNING THE ORANGE TREE

THERE are no hard and fast rules to follow, as much depends upon conditions and environment—the climate, the soil, the habit of the tree, and the treatment that it has been subjected to. Then again there is a wide diversity of opinion and practice, even among the more advanced and successful growers, all of which leaves the subject on debatable ground. There are, however, a few basic principles that must be observed if we are to obtain and maintain profitable bearing orange trees. For the most part, these practices have been observed by us not only in our nursery operations, but also in orchard work, of which we have our portion as things go in this world, to look after. Obviously we are aiming to secure maximum results at a minimum of expense; in other words secure the greatest amount of fancy and choice fruit that the tree can be made to yield by intelligent care and management. In our own experience with a number of bearing orchards pruning is done very sparingly, the object and aim being to keep the tree clear of all dead wood, to eliminate the sucker growth, so that its strength and substance may be conserved for the development of fruit-bearing wood and the perfection of its fruits. A scraggly growth is to be avoided; the tree must possess a vigorous foliage, and yet at the same time allow sunshine to permeate the same, in order to ripen and sweeten its oranges. In operating the saw and shears, care should be exercised to make clean smooth cuts; if irregular and protruding the wound is apt to sucker, thus sapping the vitality of the tree in a direction that is inimical to its bearing capacity, and vitiating the quality of its product. Care must also be exercised to avoid cutting out live wood; always aim to cut to a joint. Long and scraggly branches may be cut back, though to cut bearing wood is always to be avoided. When all the dead wood is eliminated, the tree will usually be found in a healthy bearing condition. Of course what is here meant by "dead wood" is the larger growth; the minute twigs and spines will usually drop of their own accord as they ripen and decay. A well cared for orange orchard, once under full control, will not require pruning more than once a year, though an occasional scrutiny by the experienced eye, followed by an occasional application of the shears, will be beneficial and add to its vigor and productiveness.

Two-year-old Washington Navel grove.

PRUNING THE LEMON TREE

TREATMENT of the lemon tree is much the same as the orange, only that it requires closer application and on the whole is much more severe. Allowing for the elimination of dead wood and suckering, it is of prime importance that the lemon tree be headed low, as the tendency is for the limbs to grow long and irregular; it is also essential to have the tree compact so as to harvest the crop more easily and at a minimum of cost in time and labor. The major portion of the new wood should be removed, the object being to produce a low headed and umbrageous growth. In this connection there are a few basic principles that every person operating the pruning shears on lemon trees should observe with diligence. First among these is to recognize at sight fruit wood from sucker wood. Why? Let us explain. Quality of fruit is vitiated by overlooking the development of suckers; and quantity is lowered by cutting out new growth of fruit wood under a misapprehension as to its real character. Hence follow Davy Crockett's advice, and be sure you are right before the shears go into operation. Sucker wood can invariably be distinguished by a rank and sappy growth indicated by a somewhat three-cornered or corrugated appearance to the stem in its earlier stages, the leaves being larger and more widely distributed.

Low headed trees are quite generally the rule, and yet this may be overdone. A tree with its branches constantly swishing in the cultivated soil by the action of every breeze that blows will negative the growth of fancy fruit on its lower branches; on the contrary, a tree trained high necessarily loses much of its fruit bearing wood, exposes the trunk to sunburn which superinduces a congestion of the bark, often causing an abnormal growth of suckers sapping its vitality. In the light of these conditions, to prune so that the tree's lower branches escape the ground, and yet be protective to its base, is what we recommend. Another thing is to use only the best of tools in the best of condition, so that the cutting shall be done in a clean and workmanlike manner. Make all cuts close and parallel with the base limb or trunk—such cuts being clean and free from bruise and laceration will obviate the use of paint or wax to the wound. By observing these suggestions there will be no contraction nor checking. The "know how," backed by careful observation as to the tree's condition and environment, will give desired results.

Ten acre lemon grove.

THE GRADE, THE PACK AND THE BOX

LET US picture to ourselves a grove of say twenty acres in full bearing. The fruit is of good quality and in the right condition for marketing and shipping, and hence it is of importance that we so handle it that it shall reach the consumer with all its natural beauty of form and flavor unimpaired. To accomplish this, certain operations are essential, which may be described and should in the main be carefully observed.

Hand grading and packing lemons.

The necessary number of hands to accomplish the task are on the ground, the matter of conveyances to the packing houses provided, and the paraphernalia for expediting the work supplied. Each one of the pickers is supplied with a modern picking sack with a false bottom capable of holding something like fifty oranges or one hundred lemons—everything depending on the size of the individual fruits—a pair of orange clippers, and a ladder, the latter depending for its size upon the spread and height of the tree from which the fruit is to be gathered. In harvesting a crop care must be taken to cut the stem with the clipper close to the fruit, taking each fruit in one hand while performing the act of clipping with the other. When cut, the orange should be carefully placed in the picking sack with as little handling and jostling as possible. When the picker has filled his sack he then empties it carefully into the picking boxes previously provided in close proximity to his location in the orchard. This also should be carefully done, by placing the sack with its contents gently into the box, then unhook the bottom, when it should be gently pulled away from its contents, allowing the fruit to roll out easily into the box, but not filling it so close to the top as to run the risk of bruising in stacking one box over the other. This operation is repeated until the requisite number of boxes are filled constituting a wagon load, when the fruit is hauled to the packing house. In the case of the lemon, the picker grades the fruit suitable for cropping and curing according to size, which is determined by means of a ring carried in the hand, denoting the diameter of the fruit desired.

This practically constitutes the operations in the orchard, from which the fruit is conveyed to the packing house in wagons provided with springs calculated to obviate jolts and consequent bruising and damage to the fruit. Arriving at the packing house the fruit is first submitted to a thorough cleaning by passing through a series of revolving brushes which remove all deleterious substances and dirt, which is

in turn cleared away by automatic blowers and finally removed to the outside of the building by suction; from here the fruit goes directly into automatic weighers, which dump it when the requisite weight

California picking sack.

is attained; then it is taken on a wide moving belt, and while in transit the grading is done by hand, classifying the fruit as "choice," "fancy," "standard," "offs," and "culls"; on leaving the hands of the graders it is delivered automatically into chutes, from which it is carried to the sizers, and conveyed from them directly into the packing bins, each of which designates a particular standard pack. In oranges the regular sizes are 126, 150, 176, 200, 216; small offs, 252, 288, 324, 360; large offs, 64, 80, 96, 112. Each number designates the actual quantity of individual fruit to the box. As the different grades are carried over this belt the smaller fruit reaches the sizer first and is carried to its bin, the second second, and so on until the largest specimens are delivered at the last bin in the line. This operation, in a large establishment, is continuous during the shipping season covering a working day. At each bin there is stationed a packer, whose business it is to wrap each fruit in an independent tissue wrapper, placing the same carefully into the box in which the fruit reaches the consumer. To save time and expedite the work, others take the filled box from the hands of the packer at the bins and convey them on a belt to the box press, where they are automatically pressed down and held in place while the operator securely nails down the top and stamps the number of oranges in each box on the label end; the grade is shown by the label pasted on end of box. From here the packed boxes are stacked one upon another on their sides to the required height ready for trucking into the car. Usually the labels designating the grade are placed on the empty boxes; this, however, is not imperative. A carload of packed oranges varies some in number of boxes in keeping with the size of car. A 36-foot car will take 336 boxes, a 40-foot car 384, and a 42-foot car 409—the latter a late introduction, which it is hoped will become popular in the near future. In lemons, the 36-foot car will take 288 boxes, the 40-foot 312, and the 42-foot 336. When packed the boxes are placed on end with a space for ventilation between each and every box, made feasible by nailing small strips of lumber of sufficient strength crosswise of the car. This done, the car is ready to be sealed and sent to its destination.

In the main, much the same procedure is observed in packing lemons, the difference being substantially as follows: with lemons the fruit is graded exclusively by hand at the time of shipment. Curing is in many cases optional, much depending on the condition of the market.

A Eureka lemon grove.

Too much caution, especially with lemons, cannot be observed in handling citrus fruit from the moment it is clipped from the tree until sealed up in a car only to be again handled at points of destination.

Treat each individual specimen as though it were an egg and your product will not only "stand up" under the wear and tear of handling and transportation, but will invariably bring you a better price, and enhance your reputation as a grower of fancy fruit.

It has been said that the apparel oft proclaims the man and it is also true that the package often sells the goods. Be sure your pack is uniform and true to grade, mark your package or box true to name, quality, number and size; pack boxes full, solid and uniform—fruit at top, bottom and center all alike.

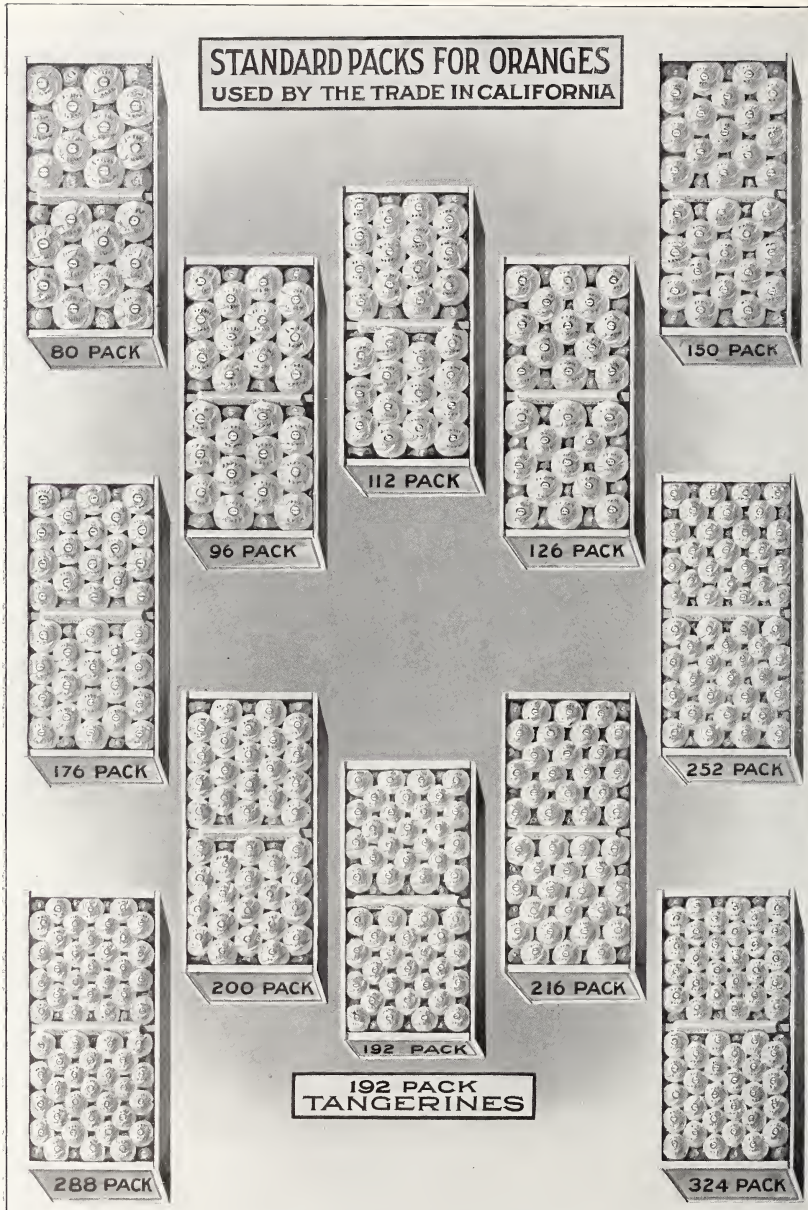
Grading and packing oranges.

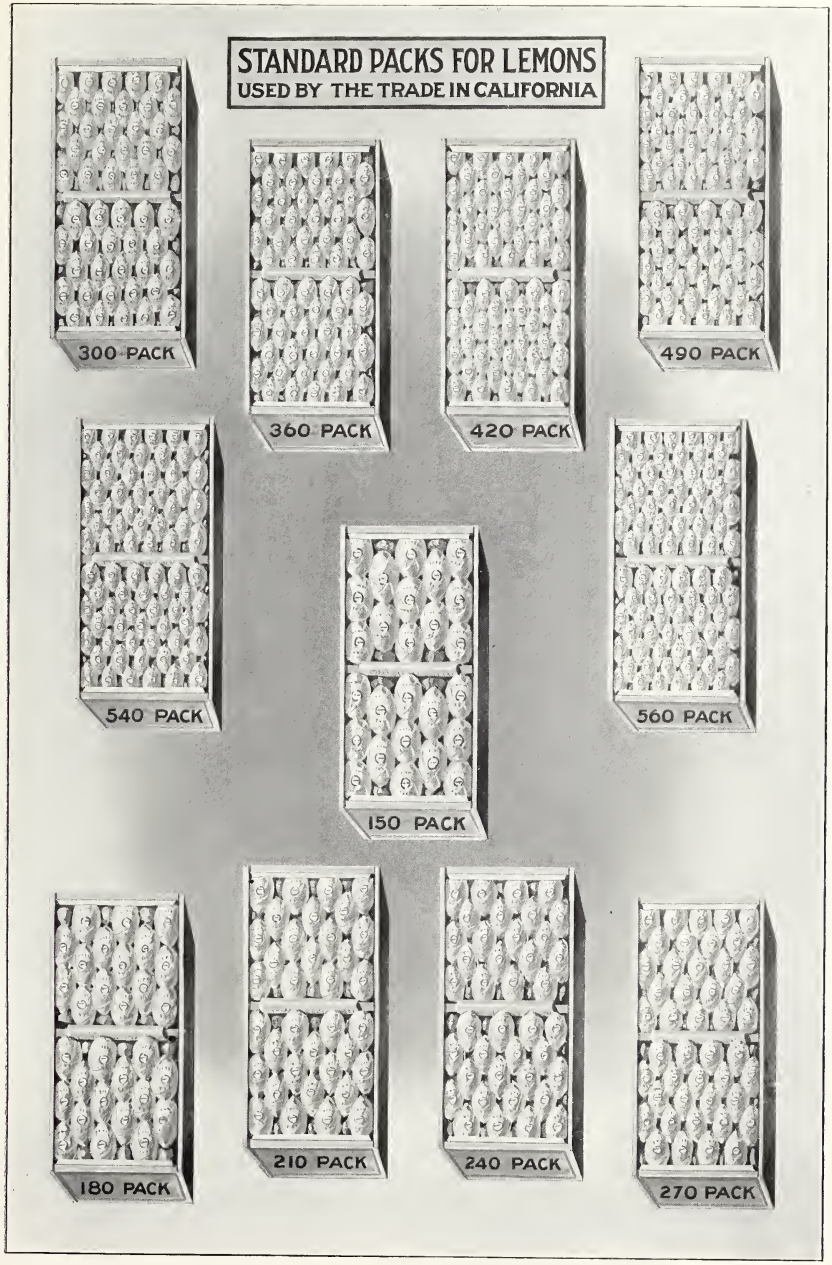
Establish a reputation for honesty and neatness, and invite buyers by making your product attractive. Give value for value, and you can rest assured, success will be yours.

Let us digress for a moment from the general topic of harvesting and marketing, and note more specifically the different methods and plans for packing the various sizes of oranges and lemons. To begin, the standard California orange box is 11½x11½x26 inches outside measurements, divided into two compartments; the standard California lemon box is 10½x14x27 inches outside measurements, divided also into two compartments. Pomelos are packed in the orange box, while the Tangerines, Mandarins and other kid glove varieties are packed in half boxes of the orange size, two of which are cleated together for shipment. In rare instances they are packed in quarter boxes, four being cleated together. The three accompanying illustrations, accurately drawn under our personal supervision directly from photographs taken in the San Dimas packing house, show the plan for packing the different sizes of oranges, lemons and pomelos as practiced by the California Fruit Exchange, and other leading packers and shippers. By following the methods of layering shown in these three illustrations the fruit will "fill" the box in such a way as to pack snugly and "stand" long-distance shipments with a minimum of wear and tear. Number of fruit to each pack, size of fruit in diameter, and number of layers to the box of different sizes, are indicated in the following table:

ORANGES

Fruits to each pack		No. of layers
80	3x2	4-4
96	3x3	4-4
112	4x3	4-4
126	3x2	5-5
150	3x3	5-5
176	4x3	5-5
200	4x4	5-5
216	3x3	6-6
252	4x3	6-6
288	4x4	6-6
324	5x4	6-6


STANDARD PACKS FOR ORANGES
USED BY THE TRADE IN CALIFORNIA
80 PACK
96 PACK
112 PACK
126 PACK
150 PACK
176 PACK
200 PACK
192 PACK
216 PACK
252 PACK
288 PACK
324 PACK
192 PACK
TANGERINES


STANDARD PACKS FOR LEMONS
USED BY THE TRADE IN CALIFORNIA
300 PACK
360 PACK
420 PACK
490 PACK
540 PACK
150 PACK
560 PACK
180 PACK
210 PACK
240 PACK
270 PACK

LEMONS

150	3x2	5-
180	3x2	6-
210	3x2	7-6
240	3x2	8-6
270	3x2	9-6
300	3x2	10-6
360	3x3	10-6
420	4x3	9-7
490	4x3	10-7
540		
560		

POMELOS

36	2x2	3x3
48	2x2	4x4
80	3x2	4x4
96	3x3	4x4

The several illustrations shown herewith afford a good idea of the investments in buildings, machinery and appliances that have, by the law of elimination, come to give the best service in the handling and manipulation of the fruit after it leaves the grower

Hand grading cured lemons.

Standard pomelo packs.

A standard lemon pack.

Standard orange packs.

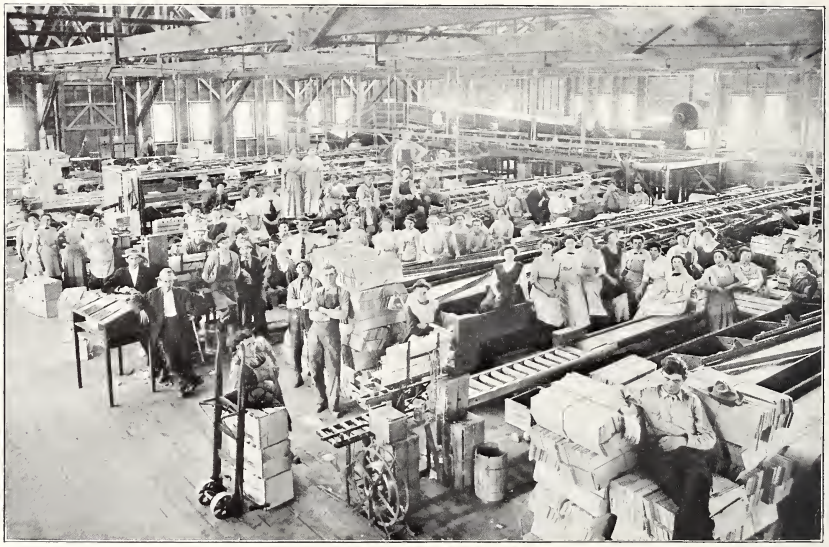
A standard Tangerine pack.

The above illustrations convey a clear idea of the standard commercial packs of citrus fruits as they appear when opened and placed on sale at points of destination. The ends of the boxes are invariably embellished with a beautiful colored label, while the sides are stenciled with the name of the shipper. Note the regular manner in which the fruit "opens up," which has much to do with its appearance and selling qualities.

THE ATMOSPHERE OF THE MARKET

NO fruit section in the world has made greater effort to exploit and develop a safe and reliable system for marketing its horticultural products than California,—ways and means that have been the labor of over a quarter of a century's experimentation. The result is that California fruits are now recognized in all the great cities of Great Britain, the continent of Europe, as well as in this country. In this quality has of course been the deciding factor, but in addition thereto methods of grading, packing, shipping, and salesmanship at points of destination, have also been potent considerations. Reference is here limited to the citrus fruits, the annual crop of which is largely marketed through co-operative associations of growers, and by individual orchardists and corporations that are also growers. Probably 90 per cent of the citrus crop is marketed in this way. The remainder is sold by packers and shippers either f. o. b. cars in California, or in a distant market, or it may be sold in lump or per box to a dealer in California. About 30 per cent of the lemon crop, and some 45 per cent of the orange crop, is sold at public auction, the principal auction markets being located in Boston, New York, St. Louis, Pittsburg, Cincinnati, Cleveland, Philadelphia Baltimore, etc. The remainder, when sold in eastern markets, is handled by agents of the associations, or by brokers, or by commission merchants who sell to jobbers or to the retail trade.

The fruit is graded in the central packing houses into two to four grades, the grade depending on the texture of the skin, the form and general appearance of the fruit. The grades are known as fancy, choice, and standard, with occasional intermediary grades known as extra choice and extra fancy. Each grade of an association or shipper is forwarded under a brand or label which in the trade stands for the particular grade of that association or shipper.



Scene in the San Dimas orange packing house.

The sizes of lemons vary from 180 to 540 per box. Few are shipped larger than the 240 or smaller than the 490 per box size. The 300 and the 360 per box sizes are the most desirable. As a rule the southern markets prefer the 360, and the markets north and east of Kansas City the 300 per box size with a greater or less variation depending on the price of fruit in the different markets.

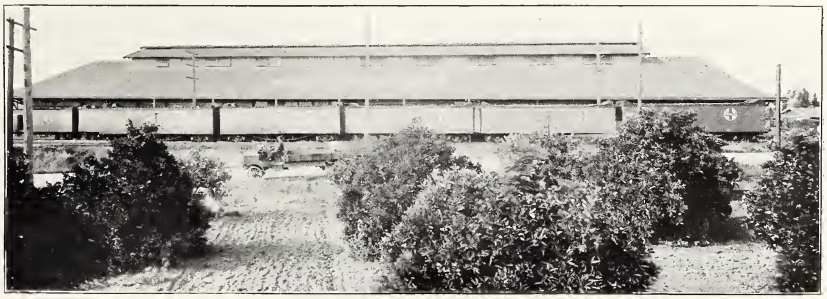
The sizes of oranges vary much the same way as the sizes in lemons, the popular grades being from

Washing and hand-grading lemons.

126 to 252 per box sizes. These are taken by the best retail, restaurant and hotel consumers. The larger sizes often command an extra price from the more wealthy class of people, while the smaller sizes possess an attraction for the cheaper restaurants and the itinerant fruit peddlers who sell from street stands and push carts.

About 75 per cent of the lemon crop is handled through the California co-operative institutions.

It is estimated that about 62 per cent of the orange output finds its way to markets through the co-operative fruit organizations. The growth of citrus culture in California is one of phenomenal proportions, and has become the foremost horticultural industry in the world. From less than 1,000,000 boxes of citrus fruits produced in 1890 the output of California has increased until this year it will be approximately 19,000,000 boxes, in carloads about 46,000, or not far from one carload every ten minutes, day and night, Sundays and all holidays, from one year's end to the other. The industry brings to California between $30,000,000 and $40,000,000 gross, and is the greatest asset of any one of California's productive resources.



San Dimas lemon packing house, largest in the world.

OVER-SEAS TRADE FOR TEAGUE TREES

"GOOD wine needs no bush," nor do good citrus trees require any endorsement other than their good behavior when planted in orchard form. Emphatically is this true of Teague orange and lemon trees, which have now stood the test of twenty-five years in the groves of California. But their fine qualities are not only a feature of this region, but also in all the countries wherever citrus fruit culture has attained commercial importance. The annual output of the San Dimas Citrus Nurseries varies with the seasons, but is always heavy, enabling the prompt filling of any orders from abroad, no matter how large. Exports of trees to distant over-sea points is perfectly feasible under our expert system of packing, boxing and shipping. As an evidence of this we reproduce here testimony from our foreign customers:

IN FIRST-CLASS CONDITION

[From A. E. Rudder & Co., Sydney, N. S. W.]

"We beg to acknowledge the receipt of your valued favor of 10th May, covering advice and documents for one box of trees to Mr. R. Hughes, Ermington, per "Sierra," and we now have pleasure in advising that this package has been safely and promptly delivered to this gentleman in apparently first-class condition."

ON THE WAY 106 DAYS AND IN GOOD CONDITION

[From J. J. Enschedo, Pretoria, Transvaal, South Africa.]

"The four boxes containing 600 orange trees shipped by you on January 26 last arrived at Pretoria on May 12. I am pleased to say that notwithstanding the trees were 106 days on the road, all arrived in the very best condition and I have much praise for the most excellent manner your trees were treated and packed, as well as for the construction of the boxes. My customer who bought these 600 trees from me is much satisfied with them. I hope, when I might order more trees from you, to get them in the same perfect condition with the same construction of boxes, which added a great deal for the success of the shipment. I lately got 1,100 trees from another firm in U. S., which arrived in a most miserable condition, a great deal owing to the very bad condition of the boxes."

THIRTY THOUSAND ARRIVE O. K.

[From H. E. V. Pickstone, Cecil Rhodes Estate, South Africa.]

"We are pleased to be able to inform you that the 30,000 trees arrived in excellent condition. Under these circumstances it is possible we may place another order at an early date for 10,000 more trees. Kindly send us small yearling trees if possible. The larger trees you consigned to us last time make an excessive freight bill. So far as the varieties are concerned we would like the majority in Thomson's Improved Navels, Navelencia, Valencia Late, Washington Navel, and send no Lemons."

Twenty carloads of boxes of oranges direct from the pickers ready for grading and packing.

A well kept and profitable Washington Navel orange grove at San Dimas.

APPROACHING A HIGH LEVEL

[From Prof. E. J. Wickson, Professor of Horticulture, California State University, Berkeley, Cal.]

"I am under great obligations to you for sending the copy of your handsome catalogue. I am delighted with the style and richness of ornamentation, also with the care and conscientiousness with which it has been prepared. I believe such publications are exceedingly creditable to California and bear evidence that our horticultural literature in commercial lines is approaching a high level. Such a catalogue is worth a place in the library of every citrus fruit grower."

IN PRIME CONDITION

[From Yokohama Nursery Co., Yokohama, Japan.]

"We beg to acknowledge receipt of your favor of March 5 and one case of orange trees which reached us yesterday, in 49 days from the date of your above advice. They are in prime condition without a single exception as they stand now. This time you have packed the roots securely in the same row so the moisture of moss kept away from coming into contact with the stems. We believe this method of packing is the best for long journey. We thank you for your liberal treatment in replacing them free."

Lath house containing ten thousand balled trees ready for shipment.

EN ROUTE MAY TO SEPTEMBER AND GROWING

[From A. E. Lowrie, Chindwara, C. P., India.]

"I wrote and told you about the plants I brought out with me. Out of those I have ten plants coming on, though they have not shown much growth yet, five Navels, three Valencias and two Improved Thomson Navels. The plants reached me on the 1st of September and were put down at once. Most of them had sprouted in the box, but the sprouts for want of light were pale and after a few hours changed color and look quite strong, and though not making as much growth as I should like them to, look healthy. Friends to whom I have shown the plants can hardly credit their being in the box from May to September. Only three plants have died outright."

ARRIVED IN FINE ORDER

[From Allen Herbert, Honolulu.]

"The box of trees arrived in fine order and have put one-half of them into Saki tubs. Shall probably order more trees by next mail."

TREES ARRIVE ALL RIGHT

[From Mrs. L. D. Ulmer, San Luis Potosi.]

"The orange trees arrived and I have them planted, they looked all right and in good condition. I thank you for the extra trees, they were beauties and I am glad to have them. I think I will have to order another lot from you to replace some of the first shipment as a short time after I received them, and before they had time to take root or gather any strength, we had the hardest spell of cold weather ever experienced in this section, even by the oldest inhabitant. I enclose check for $45.00 and expense bills on last shipment. This is to cover the expenses which accrued on both shipment to this place."

ENERGETIC AND CLEVER

[From Steidtmann & Nagel, Fruit Growers, Hamburg, Germany.]

"Your catalogue on Citrus Trees commands our attention and admiration. Many thanks for it. We consider your firm energetic and clever."

A citrus tree budded to twenty-two different varieties.

Balled citrus trees ready for shipment.

POMELOS ARE THRIVING BEAUTIFULLY

[From W. D. Baldwin, M. D., Honolulu, T. H.]

"Last winter you sent me a shipment of citrus trees. They all turned out well except the Valencia Lates. Five out of six of these died and the one that lived is not thrifty. The other trees, specially the Pomelos, are thriving beautifully. They may have been sent at the wrong time of the year for the Valencias."

ARRIVED IN SPLENDID CONDITION

[From Juan Dalman, Salaverry, Peru.]

"The three cases of orange trees arrived in splendid condition. Only thirty of them had the stalks dry; but the roots were all right. I enclose cheque, New York, for $200.00 to apply on a new order of 100 Washington Navels, 100 Thomson's Improved Navels, 100 Navelencias. I beg of you to make the shipment as soon as possible.

Gold medal awards on Teague trees at three International Expositions.

AN APPRECIATION AND A PROMISE

IT has been said that the man who succeeds, does so because possessing the "know how." This aphorism applies to no business so strongly as it does to citrus fruit growing. Obviously, in its physical aspects it is one of the most alluring occupations of suburban life. No one division of our horticultural development combines utility and beauty in so wide a sense, and no other line of fruit growing in the United States can show a growth covering so small an area and only a trifle over a quarter century old, whose investments represent two hundred millions of dollars and an annual output of over forty millions gross. To have in only a small measure been instrumental in this development is with us a pleasant recollection; to be conscious of the fact that literally thousands of citrus trees now yielding bounteous crops are the products of the San Dimas Citrus Nurseries, is to us a satisfaction and a joy. So keenly appreciative are we of this distinction that it shall ever be our aim to supply the citrus fruit growers with the best trees that care, skill, experience and our natural advantages of soil and climate can possibly be made to produce. Our interests and ambitions are to serve all directly interested in citrus fruit farming, not only in the establishment of new groves, but also in the maintenance of those already in bearing. In this connection, we are always willing to lend the helping hand in the way of suggestion and consultation, realizing that that which is to the interest of the grower has a direct bearing on the future of our nursery business. The success of citrus fruit production and marketing is of as much concern to us as the production of citrus trees; hence, we shall always appreciate the opportunity to render assistance to those who are part and parcel of its personnel and success.

TOPICAL INDEX

Address all orders:

San Dimas
Citrus Nurseries
San Dimas, California

THE BOSS TREE PROTECTOR

PATENT APPLIED FOR

SOMETHING NEW
MADE OF THE YUCCA PALM

COLOR, LIGHT

A Perfect Protection against Rabbits, Grasshoppers, Borers, Heat of the Sun and Frost

It is quicker to put on than any other Tree Protection in the Market. No strings to Tie. Ready for Immediate Use. Is open grained and Allows Free Circulation of Air. Can be Readily Taken off to Spray the Trees. Not affected by Rain. *Cheap, durable and guaranteed to give satisfaction.*

Length	Width	per 1000	Weight per 100	Extra per inch for additional width to order
30 in.	7 in.	$21.00	22 lbs.	$3.00 per inch per 1000
24 "	7 "	18.00	18 "	2.55 " "
18 "	7 "	15.00	13 "	2.15 " "
16 "	7 "	13.50	12 "	1.95 " "
14 "	7 "	12.00	10 "	1.75 " "
12 "	7 "	11.00	9 "	1.60 " "
10 "	7 "	10.00	.....	1.45 " "

FOUNDED IN 1889 BY R. M. TEAGUE

THE SAN DIMAS CITRUS NURSERIES

INCORPORATED

THE HOME OF "QUALITY" CITRUS TREES

TEAGUE CITRUS TREES Have been awarded the Gold Medal at the Saint Louis World's Fair, the Buffalo Pan-American Exposition, the Lewis and Clark Centennial Exposition, and the Alaska-Yukon-Pacific Exposition. Wherever known they stand supreme for quality and quantity yield of fruit. Twenty-five years experience growing trees.

CAT31298591

Principles and practices of citrus culture in California : a treatise describir methods from the nursery tree to the full bearing orchard, including the harvesting and packing, that have made the citrus industry of California t admiration of pomologist

San Dimas Citrus Nurseries,

1914

Batch: NC15_1914_Sa-Se

CAT31298591

In additions NC16-191

APRIL2013

LEFT

24ColorCard CameraCraps.com